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## Towards the EU fusion-oriented neutron source: the Preliminary Engineering Design of IFMIF-DONES

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The need of a high-intensity, 14 MeV-peaked neutron source for the qualification of materials under fusion-relevant conditions has been recognized in the European (EU) fusion programme as an essential step towards the design and licensing of DEMO and future commercial fusion power plants. This need has pushed the EU to support the development of a Li(d,nx) neutron source called IFMIF-DONES (International Fusion Materials Irradiation Facility-DEMO Oriented Neutron Source) based on and taking advantage of the results obtained in the IFMIF/EVEDA (Engineering Validation and Engineering Design Activities) project conducted in the framework of the bilateral EU-Japan Broader Approach Agreement.

The design activities and the supporting R&D work of the DONES facility are presently being carried out in the framework of the Work Package Early Neutron Source (WPENS) of the EUROfusion consortium in close collaboration with Fusion for Energy agency, with the main goal of consolidating the underlying technology and developing a sound design basis in order to be ready for IFMIF-DONES construction at the early beginning of the next decade.

In this paper, the main engineering advances achieved during the first three years of the WPENS project and included in the recently released IFMIF-DONES Preliminary Engineering Design Report as an important milestone of the project are presented, focusing in particular on the main design evolutions from the previous phases and on the critical aspects to be further developed in the near future.

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